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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/806,457	06/14/2001	Christian Caspersen	0459-0577P	1421
2292	7590	02/17/2005	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			LEE, SHUN K	
			ART UNIT	PAPER NUMBER
			2878	

DATE MAILED: 02/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

3/11/05

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/806,457	CASPERSEN, CHRISTIAN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Shun Lee	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,7-16,23-25,27-29,36-40,44 and 45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,7-16,23-25,27-29,36-40,44 and 45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 22 December 2004 has been entered.

### ***Claim Objections***

2. Claims 1 and 29 are objected to because of the following informalities:
- (a) in claim 1, "marked objects" on line 9 should probably be --the marked objects-- (see "marked object" on lines 1-2 in claim 1);
  - (b) in claim 29, "the at least first light source" on line 13 should probably be --the first light source-- (see "a first light source" on line 5 in claim 29);
  - (c) in claim 29, "the marked objects" on line 14 should probably be --the object-- (see "an object" on line 1 in claim 29);
  - (d) in claim 29, "the marked objects" on line 15 should probably be --the object-- (see "an object" on line 1 in claim 29); and
  - (e) in claim 29, "the marked objects" on line 16 should probably be --the object-- (see "an object" on line 1 in claim 29).

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 7-14, 27, 29, 36, 37, 40, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reber *et al.* (US 6,110,748) in view of Gordon (US 5,892,577).

In regard to claim 1, Reber *et al.* disclose (Fig. 1) an apparatus for detecting a property of marked object contained in a specimen, the apparatus comprising:

- (a) a frame (is inherent in positioning mechanism 42; column 4, lines 17-28),
  - (b) a member (20) positioned on the frame and having a surface that is adapted to receive and hold the specimen (column 2, line 28 to column 3, line 7),
  - (c) at least a detector (38) for detecting a light (*i.e.*, fluorescence which inherently requires interaction with at least a first light beam emitted by a first light source since fluorescence is defined<sup>1</sup> as the "emission of electromagnetic radiation, especially of visible light, stimulated in a substance by the absorption of incident radiation and persisting only as long as the stimulating radiation is continued") emitted from marked objects (*i.e.*, fluorescent members; column 3, lines 43-47),
- and

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<sup>1</sup> The American Heritage® Dictionary of the English Language, Third Edition copyright © 1992 by Houghton Mifflin Company. Electronic version licensed from INSO Corporation; further reproduction and distribution restricted in accordance with the Copyright Law of the United States. All rights reserved.

(d) scanning means (42) for scanning the specimen in relation to the detector (38) along a non-linear curve (e.g., spiral 152 in Fig. 12), wherein the scanning means comprises means (*i.e.*, rotary positioning mechanism; column 4, lines 17-28; column 9, lines 37-40) for rotating the member and means (*i.e.*, translational positioning mechanism; column 4, lines 17-28; column 9, lines 37-40) for displacing the member, so as to detect the property of the marked objects in the entire specimen, the means for rotating and the means for displacing being simultaneously directly connected to the member (*i.e.*, a rotary positioning mechanism such as a spindle or a turntable, a translational positioning mechanism such as a conveyor, and/or a multiple degree of freedom positioning mechanism such as a robotic arm; column 4, lines 17-28), the member being simultaneously rotatable and displaceable (*i.e.*, the step of positioning at least one of the device 20 and the detector 38 can include translating the device 20, rotating the device 20, translating the detector 38, and/or rotating the detector 38; column 9, lines 37-40).

The apparatus of Reber *et al.* lacks an explicit description that the member is displaced along a radius of the rotation of the member and that the first light source and the detector being arranged so that a part of a light beam path from the first light source to the specimen is co-extensive with a part of the light emitted from the marked objects. However, Reber *et al.* also disclose (column 3, line 56 to column 4, line 10) to provide a CD-ROM or DVD reader comprising detector 38 and (column 5, lines 1-9) that the positioning mechanisms are operated to collect data in a sequential manner from sites

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along annular (e.g., circular 140 in Fig. 11) or spiral (e.g., spiral 152 in Fig. 12) tracks (column 3, lines 5-7). It should be noted that a spiral track is generated by relative translation along a radius of the rotary movement. Further, CD-ROM (i.e., compact discs) readers are well known in the art. For example, Gordon teaches (column 5, lines 28-31 and 64-67; Fig. 1) that a conventional compact disc reader comprises of a light beam path from a light source (8) to disc (1) that is co-extensive with a part of the light from the disc (1) to a detector (11). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the annular or spiral specimen scanning in the apparatus of Reber *et al.* is effected by relative translation along a radius of the circular movement of the member using the translational positioning mechanism and that the conventional CD-ROM or DVD reader comprising detector (38) have a conventional optical arrangement wherein a light beam path from a light source to disc is co-extensive with a part of the light from the disc to a detector.

In regard to claim **29**, the method steps are implicit for the apparatus of Reber *et al.* since the structure is the same as the applicant's apparatus of claim 1.

In regard to claim **7** which is dependent on claim 1, Reber *et al.* also disclose (column 4, lines 17-28) that the member is positioned for rotation about an axis on the frame and wherein the means for rotating the member rotates the member about the axis.

In regard to claims **8** and **9** which are dependent on claim 1, Reber *et al.* also disclose (column 5, lines 1-9) scanning control means (e.g., processor 36) controlling the scanning means for scanning the specimen along a predetermined curve and that

the scanning control means are adapted to control the scanning means in such a way that the predetermined curve is a substantially circular curve (e.g., circular 140 in Fig. 11).

In regard to claim **10** (which is dependent on claim 8) and claim **36** (which is dependent on claim 29), Reber *et al.* also disclose (column 5, lines 58-62) storage means (e.g., memory 49 or device 20) for storage of detector signals (related to the detected property) provided by the detector (38) and corresponding position signals (related to the current position of the member) provided by the scanning control means.

In regard to claim **11** (which is dependent on claim 10) and claim **37** (which is dependent on claim 36), while Reber *et al.* also disclose (column 3, lines 56-60; column 4, lines 4-10) a CD-ROM or DVD reader which provides signals for processing by a processor such as a computer (column 5, lines 1-22), the apparatus of Reber *et al.* lacks an explicit description of means for sampling and digitizing the detector signals and the position signals. Gordon teaches (column 8, lines 15-56) to transfer detected signal data to a computer via a means for sampling and digitizing the signals. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a means for sampling and digitizing the detector signals and the position signals in the apparatus of Reber *et al.*, in order to convert the data to a form suitable for processing by a computer.

In regard to claim **12** which is dependent on claim 1, Reber *et al.* also disclose (column 5, lines 1-22) signal processing means (e.g., processor 36) operatively

connected to the detector (38) to detect a presence of an object based on the detector signals.

In regard to claims **13** and **14** which are dependent on claim 12, the apparatus of Reber *et al.* lacks that the detected object positions stored in the storage means are retrieved and used by said scanning means to position a means for optical inspection of detected objects. Gordon teaches (column 5, lines 58-62; column 6, lines 4-10 and 19-32; column 7, line 55 to column 8, line 27) that the detected object positions stored in the storage means are retrieved and used by said scanning means to position a means for optical inspection of detected objects (*i.e.*, "look again at specific region of interest"; column 6, lines 4-10). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to position an optical inspection means (*e.g.*, CD-ROM reader) in the apparatus of Reber *et al.* using the scanning means and retrieved stored detected object positions, in order to look again at specific regions of interest (*e.g.*, any desired target object).

In regard to claim **27** which is dependent on claim 1, while Reber *et al.* also disclose (column 3, lines 56-60; column 4, lines 4-10) a CD-ROM or DVD reader, the apparatus of Reber *et al.* lacks an explicit description that the CD-ROM or DVD reader comprises a coherent light source. However, CD-ROM (*i.e.*, compact discs) readers are well known in the art. For example, Gordon teaches (column 5, lines 28-31 and 64-67) that a conventional compact disc reader comprises a coherent light source. Therefore it would have been obvious to one having ordinary skill in the art at the time of the



invention that the detector (*e.g.*, a CD-ROM reader) in the apparatus of Reber *et al.* comprises a coherent light source.

In regard to claim **40** which is dependent on claim 1, Reber *et al.* also disclose (column 3, lines 39-47) that the marked objects are marked with a fluorescent stain.

In regard to claim **44** which is dependent on claim 1, the apparatus of Reber *et al.* lacks that the detector comprises a CCD device. Gordon teaches (column 10, lines 7-19) to provide a CCD device for scanning a disc in order to obtain higher speed and higher resolution. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a CCD device as the detector in the apparatus of Reber *et al.*, in order to obtain higher speed and higher resolution.

5. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reber *et al.* (US 6,110,748) in view of Gordon (US 5,892,577) as applied to claim 1 above, and further in view of Demers (WO 98/12559).

In regard to claims **15** and **16** which are dependent on claim 1, while Reber *et al.* also disclose (column 7, lines 59-62) a member such as a standard CD-ROM to receive and hold the specimen, the modified apparatus of Reber *et al.* lacks that the specimen has an area larger than 500 mm<sup>2</sup> (*e.g.*, larger than 8000 mm<sup>2</sup>). However, standard CD-ROMs (*i.e.*, compact discs) are well known in the art. For example, Demers teaches (pg. 5, third paragraph) that a compact disc is a 5.5 inch disc. A ~15328 mm<sup>2</sup> area has a diameter of ~140 mm (5.5 inch). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the ~15328 mm<sup>2</sup> area (*i.e.*,

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standard CD-ROM sized) member in the modified apparatus of Reber *et al.* is capable of receiving and holding specimens of  $\sim 15328 \text{ mm}^2$  area or less (e.g., larger than  $500 \text{ mm}^2$  or  $8000 \text{ mm}^2$ ).

6. Claims 23-25, 28, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reber *et al.* (US 6,110,748) in view of Gordon (US 5,892,577) as applied to claims 1 and 40 above, and further in view of Ekins *et al.* (Multianalyte microspot immunoassay-microanalytical "compact disk" of the future, Clinical Chemistry, Vol. 37, no. 11 (1991), pp. 1955-1967).

In regard to claims **23-25** which are dependent on claim 1, the modified apparatus of Reber *et al.* lacks that a mask is inserted in the optical path between the specimen and the detector, wherein the mask comprises at least one transparent aperture having a substantially rectangular shape with at least one dimension of the aperture, as projected on the specimen, between 0.75 and 2 times the dimensions of objects to be detected. Ekins *et al.* teach (left column on pg. 1964) that the highest signal/noise ratio is observed when the instrument field of view is restricted to a microspot area. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide an aperture in the modified apparatus of Reber *et al.* to restrict the field of view to substantially a microspot area (*i.e.*, matching size and shape), in order to detect fluorescent members with a desired signal/noise ratio.

In regard to claim **28** which is dependent on claim 1, the modified apparatus of Reber *et al.* lacks that the first light beam is adapted provide a light spot having a

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diameter between 20-150  $\mu\text{m}$  on the specimen. Ekins *et al.* teach (left column on pg. 1963) that as the area decreases, the signal/noise ratio increases and approaches a maximum value of 60 as the area falls below 0.01  $\text{mm}^2$ . A 0.01  $\text{mm}^2$  area has a diameter of 112  $\mu\text{m}$ . Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a light spot having a diameter between 20-150  $\mu\text{m}$  (e.g., 112  $\mu\text{m}$ ) on the specimen in the modified apparatus of Reber *et al.*, in order to detect fluorescent members with a desired signal/noise ratio.

In regard to claim **45** which is dependent on claim 40, while Reber *et al.* also disclose (column 3, lines 39-47) the detection of fluorescent members, the modified apparatus of Reber *et al.* lacks that the fluorescent marker is Fluorescein. However, fluorescent markers such as fluorescein are well known in the art. For example, Ekins *et al.* teach (left column on pg. 1965) that fluorescein fluorescent markers (e.g., FITC) are commercially available. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the fluorescent members in the modified apparatus of Reber *et al.* is a known fluorescent member (e.g., Fluorescein).

7. Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reber *et al.* (US 6,110,748) in view of Gordon (US 5,892,577) as applied to claim 14 above, and further in view of Virtanen (US 6342349).

In regard to claims **38** and **39** which are dependent on claim 14, while Reber *et al.* also disclose (column 3, lines 56-60; column 4, lines 4-10) a CD-ROM or DVD reader, the modified apparatus of Reber *et al.* lacks that the means for optical inspection is a microscope (e.g., an automated microscope). Virtanen teaches (column

48, lines 41-48) that with proper software, optical disk readers are scanning confocal laser microscopes which allow the study of the detailed structure of biological and other specimens. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide software in the modified apparatus of Reber *et al.* so that the detector (e.g., CD-ROM reader) is used as an automated microscope for the study of the detailed structure of biological and other specimens.

### ***Response to Arguments***

8. Applicant's arguments filed 22 December 2004 have been fully considered but they are not persuasive.

Applicant argues (second and third paragraphs on pg. 12 of remarks filed 22 December 2004) that Reber *et al.* do not teach that the spindle/turntable and the conveyor are simultaneously directly connected to the device 20 since the device 20 can only be either on a spindle/turntable or on a conveyor. Examiner respectfully disagrees. Reber *et al.* state (column 4, lines 18-24) that "Depending on the form of the device **20** and the arrangement of the machine-readable data and the molecular receptors, the positioning mechanism **34** can include a rotary positioning mechanism such as a spindle or a turntable, a translational positioning mechanism such as a conveyor, and/or a multiple degree of freedom positioning mechanism such as a robotic arm". The key phrase is "and/or". Thus Reber *et al.* expressly teach a positioning mechanism 34 directly connected to the device 20 and comprising both a translational positioning mechanism and a rotary positioning mechanism.

Applicant argues (fourth paragraph on pg. 12 of remarks filed 22 December 2004) that Reber *et al.* fail to teach that the member is simultaneously rotatable and displaceable along a radius of the rotation of the member since Reber *et al.* teach that the positioning mechanism 42 can include a rotary positioning mechanism and/or a translational positioning mechanism. Examiner respectfully disagrees. Reber *et al.* state (column 9, lines 37-40) that "The step of positioning at least one of the device **20** and the detector **38** can include translating the device **20**, rotating the device **20**, translating the detector **38**, and/or rotating the detector **38**". The key phrase is "and/or". Thus Reber *et al.* expressly teach that the step of positioning comprises both translating and rotating the device 20. Further, Reber *et al.* disclose (see Fig. 12) a spiral lattice along which binding sites can be arranged. It should be noted that a spiral track is generated by relative translation along a radius of the rotary movement. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the annular or spiral specimen scanning in the apparatus of Reber *et al.* is effected by translating along a radius of the rotation of the device 20 and simultaneously rotating the device 20.

### **Conclusion**


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SL

  
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PRIMARY EXAMINER  
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